

REMARKS

Claim Status

Applicants acknowledge, with appreciation, the allowance of claims 21 and 22, and the indication that claims 5, 6, and 14 contain allowable subject matter. Claims 1, 4-16 and 18-23 are presented for examination, with claims 1, 21, 22 and 23 being the independent claims. Claim 1 has been amended to incorporate the subject matter of claim 3. Claim 3 has been canceled. No new matter has been added. Reconsideration of the application, as amended, is respectfully requested.

Overview of the Office Action

Claims 1 and 19 have been objected to for failing to comply with the written description requirement. Withdrawal of the rejection is requested.

Claims 1, 4 and 20 stand rejected under 35 U.S.C. §102(e) as anticipated by U.S. Patent No. 6,523,948 ("*Matsumoto*"), while claims 3, 7 and 12 stand rejected under 35 U.S.C. §103(a) as obvious over *Matsumoto* in view of U.S. Patent No. 6,746,115 ("*Tomotake*"). Claim 23 stands rejected under 35 U.S.C. §102(e) as anticipated by U.S. Patent Publication 2003/0231234 ("*Ushirogouchi*"). Claims 11, 13 and 16 stand rejected under 35 U.S.C. §103(a) as obvious over *Matsumoto* in view of *Tomotake*, and further in view of U.S. Patent No. 6,460,990 ("*Yraceburu*"). Claims 8 and 9 stand rejected under 35 U.S.C. §103(a) as obvious over *Matsumoto* in view of *Tomotake*, and further in view of EP 0 307 251 ("*Tasaki*"). Claims 10 and 15 stand rejected under 35 U.S.C. §103(a) as obvious over *Matsumoto* in view of *Tomotake*, and further in view of U.S. Patent No. 5,287,123 ("*Medin*"). Claim 18 stands rejected under 35 U.S.C. §103(a) as obvious over *Matsumoto* in view of U.S. Patent No. 6,619,777 ("*Chang*"). Lastly, claim 19 stands rejected under 35 U.S.C. §103(a) as obvious over *Matsumoto* in view of

Ushirogouchi. The Examiner mistakenly refers to the *Ushirogouchi* published US application by the number 2003/023123. The correct publication number is 2003/0231234.

Response to Formalities

Claims 1 and 19 have been objected to for failing to comply with the written description requirement. The Examiner points out that claim 1 recites "before the jetted ink [is] received on the recording medium" and claim 19 recites "the active energy ray is radiated in 0.001-2.0 seconds after the jetted ink [is] received on the medium." The Examiner contends that this "is not clear" because "Both claims are totally opposite to each other". In response to this statement, Applicants respectfully assert that claims 1 and 19 are not totally opposite to each other. The quoted recitation from claim 1 is part of the temperature-controlling mechanism, whereas the quoted recitation from claim 19 is part of the claimed ultraviolet radiation section. These are two different components of the claimed apparatus that can be, and are, activated at different stages of the dot formation on the recording medium. Claims 1 and 19 are, therefore, clear and fully comply with the written description requirement. Thus, reconsideration and withdrawal of this objection are in order.

Patentability of the Claims under 35 U.S.C. §102

Applicants have carefully considered the Examiner's rejections and the comments provided in support thereof. For the following reasons, Applicants respectfully assert that all claims presented for examination in the present application are patentable over the cited references.

In accordance with the claimed invention, when a cationic polymerization type of ink is used, it is particularly important for facilitating the curability of such ink with UV light that the temperature of the received ink be controlled to a given temperature range **before** the ink is

radiated by the UV light. Accordingly, by controlling the temperature of the recording medium within a preset target temperature range before the cationic ink is received on the recording medium, the pre-heated recording medium brings the cationic ink once it is received on the recording medium to a selected temperature that facilitates its curing with UV light. As a result, when the active energy ray irradiates the ink on the medium, the curability of the cationic ink will have been raised.

Since the subject matter of claim 3 has been incorporated into claim 1, the amended claim, in effect, stands rejected under 35 U.S.C. §103(a) as being obvious over *Matsumoto* in view of U.S. Patent No. 6,746,115 ("*Tomotake*"). The Examiner points out that *Tomotake* teaches use of a cationic resin and, based on that, concludes

"It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the ink having cationic characteristics ... of *Tomotake* et al. in the ink jet printer apparatus of *Matsumoto* et al. in order to obtain faster better ink drying properties with the use of an ultraviolet source."

Matsumoto discloses use of heating elements 27 in thermal head 22 for curing the ink. Column 6, lines 1-16 describes use of heating regions 27. Column 13, lines 37-67 describes use of infrared laser diodes (IRLDs) 130 used as "heating ray emitting elements" to dry the ink. The IRLDs are consistently described as being used only for providing heat to dry the ink (col. 6, lines 60-67).

On the other hand, the embodiment shown in *Matsumoto*'s Fig. 19 uses a UV curable type of ink and a UV emitting laser unit 152 "disposed instead of the IRLDs 130." Thus, this embodiment cures the ink only with UV light.

Consequently, it is clear that *Matsumoto* teaches use of only heat to dry the ink or only UV light to cure the ink. *Matsumoto* does not disclose, nor even hint at, applying the proper amount of heat to a cationic ink before it is irradiated with UV light in order to enhance curing of

the cationic ink with the UV light. This approach, unique to the present invention, uses the combination of heat and UV light to produce a superior result with a cationic ink.

The Examiner has applied *Tomotake* because it discloses use of a cationic resin. However, *Tomotake's* use of such resin has nothing to do with its curing by UV light. Rather, *Tomotake* discloses only that the ink is dried at drying station 4 with applied heat. The use of a cationic ink is mentioned in passing in column 6 of *Tomotake* as one of many types of ink, with the key factor being that they all must have in common is that they must satisfy the formula disclosed in the text spanning columns 3 and 4. Thus, *Tomotake* contributes nothing to bridge the gap between the present claimed invention and *Matsumoto*.

The undeniable fact is that *Matsumoto*, whether applied alone or in combination with any other of the applied references, including *Tomotake*, does not obviate the present invention which advantageously combines the specified use of heat and UV light to cure a cationic ink.

As pointed out above, the Examiner reaches the conclusion that "It would have been obvious to ... use the ink having cationic characteristics ... of *Tomotake* et al. in the ink jet printer apparatus of *Matsumoto* et al. in order to obtain faster better ink drying properties with the use of an ultraviolet source." Thus, the stated motivation is "to obtain faster better ink drying properties with the use of an ultraviolet source." However, this statement presupposes that one would know that such a result could be obtained in this way.

Query: How would one of ordinary skill in the art at the time the invention was made know combining heat and UV light for curing a cationic ink would result in "faster better ink drying properties"?

One would not know that from *Matsumoto*. It says nothing about this. In fact, as has been established above, *Matsumoto* explicitly uses only heat or only UV light.

One also would not know that from *Tomotake*. It uses only heat, even for drying a cationic ink!!!

In actuality, the Examiner provides no basis whatsoever for this conclusion.

The motivation relied on by the Examiner could only have been derived from hindsight based on the present invention which, of course, is improper as the basis for a rejection. Consequently, the rejection must fall at least for lack of the requisite motivation to support the combination of applied references.

Moreover, as has been fully argued in the previously-filed Amendment (which the Examiner is respectfully requested to consider once again), none of the remaining references discloses other claimed features of the present invention. In particular, the feature of "a temperature controlling mechanism for controlling the temperature of the recording medium which is carried by the carrying section within a preset target temperature range" is not disclosed, nor is the feature of bringing the temperature of the recording medium within such preset target temperature range "before the jetted ink is received on the recording medium."

In view of the above, it is respectfully submitted that amended claim 1 clearly and patentably defines the invention over the cited references when applied singly or in combination.

Claim 23 is the only other independent claim rejected over prior art. However, it is respectfully submitted that arguments presented above with respect to claim 1 also apply to claim 23. Therefore, claim 23 is also allowable over the prior art.

Dependent claims

In view of the patentability of independent claims 1 and 21-23, for the reasons presented above, each of dependent claims 4-16 and 18-20 is patentable therewith over the prior art.

Moreover, each of these claims includes features which serve to even more clearly distinguish the invention over the applied references.

Conclusion

Based on all of the above, it is respectfully submitted that the present application is now in proper condition for allowance. Prompt and favorable action to this effect and early passing of this application to issue are respectfully solicited.

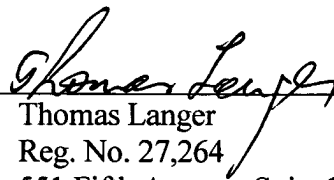
Should the Examiner have any comments, questions, suggestions or objections, the Examiner is respectfully requested to telephone the undersigned in order to facilitate reaching a resolution of any outstanding issues.

It is believed that no fees or charges are required at this time in connection with the present application. However, if any fees or charges are required at this time, they may be charged to our Patent and Trademark Office Deposit Account No. 03-2412.

Respectfully submitted,

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